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Lutreolina crassicaudata.

By Larry G. Marshall

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Lutreolina Thomas, 1910

Lutreolina Thomas, 1910:247. Type species *Lutreolina crassicaudata* by monotypy.

CONTEXT AND CONTENT. Order Marsupialia, Superfamily Didelphoidea, Family Didelphidae, Subfamily Didelphinae. The genus *Lutreolina* includes only one living species, *Lutreolina crassicaudata*.

Lutreolina crassicaudata (Desmarest, 1804)

Coligrueso, Comadreja Colorada, or Cuica

Didelphys crassicaudata Desmarest, 1804:19. Type locality, Paraguay.

Didelphys turneri Günther, 1879:108. Type locality near Better Hope, Demerara, Guyana.

CONTEXT AND CONTENT. Context noted above. Two subspecies are recognized as follows:

L. c. crassicaudata Desmarest, 1804:19, see above (*macroura* Illiger, *paranalis* Thomas, *bonaria* Thomas, *lutrilla* Thomas, *ferruginea* Larrañaga, and *travassosi* Miranda Ribeiro are synonyms).

L. c. turneri Günther, 1879:108, see above.

DIAGNOSIS. Similar in size to *Philander opossum*. No eye-spots or other prominent markings on face. Rhinarium is as in *Metachirus nudicaudata*, but upper edge has a rounded posterior projection, which is sharply defined from the hairy part of the face. Ears are short, rounded, and barely project above the fur; laid forward they reach barely half the distance to the eyes; the inner edge has a long basal projection. Metatragus is well developed and rounded. Pouch is undeveloped. Nine mammae are present. Limbs and feet are short and stout, and pads are small and narrow. The fifth hind toe reaches only to the middle of the first phalanx on fourth toe. Hallux and pollex are not fully opposable. Tail is thick at base and passes imperceptably into the body. The basal half of the tail is thickly furred, as the body, but with thin short hair, proximally brown or black and terminally white. Only about 50 mm of the ventral surface of the tip is naked; the tail is not as prehensile as in other didelphids.

The skull is different in general outlines from other didelphids (figure 1). Cranial and zygomatic regions are long and narrow relative to the unusually short rostrum. Nasals are short and narrow, evenly expanded posteriorly. Zygomatic arch is long, high, and strong but not widely expanded. Braincase is long relative to size of skull and forehead is gently domed. Postorbital processes are prominent and conical. Interorbital region is narrow and smoothly rounded. Space between the level of the postorbital processes and most contracted point of braincase is long and narrow (Cabrera and Yepes, 1960:27–29; Lydekker, 1894: 203; Stichel, 1929; Thomas, 1888:334–335; Walker *et al.*, 1968: 23).

GENERAL CHARACTERS. Length of head and body is 250 to 400 mm, and length of tail is 210 to 310 mm. Adults weigh from 200 to 540 g (Walker *et al.*, 1968:23). Mean and extreme measurements (in parentheses) for tooth and cranial measurements, in millimeters, of a large sample (N = 39 to 43) of male and female specimens of *L. crassicaudata* from Argentina, Uruguay, and Brazil (after Ximénez, 1967: table 1) are: condylobasal length of skull, 68.7 (54.7 to 82.5); transverse breadth of zygomatic arch, 36.5 (28.6 to 46.2); temporal constriction, 7.9 (7.2 to 8.8); length of mandible, 53.3 (43.8 to 63.7); length of upper toothrow, 27.2 (22.8 to 31.3); length of lower toothrow, 28.9 (24.1 to 33.8), length of first three upper molars, 10.4 (9.5 to 12.2). Dental formula as in other didelphids, i 5/4, c 1/1, p 3/3, m 4/4, total 50.

DISTRIBUTION. The present distribution of *L. crassicaudata* is rather peculiar (figure 2). Its major center of occurrence includes Argentina north of Chubut and east of the Andes, Uruguay, Paraguay, parts of Bolivia, and southern Brazil. A line connecting Rio de Janeiro in Brazil to Beni in Bolivia roughly marks the northernmost distribution of this population (Hershkovitz, 1972:403). Another population, known from only two specimens (Thomas, 1888:335), occurs near Demerara, British Guiana (Guyana). Presumably geographically intermediate populations occur, or did occur, in the uplands of the Amazon and Orinoco basins (Hershkovitz, 1972:403), although no specimens are presently known from these areas. Ximénez (1967:4) noted: "The only reason that we are not able to explain the absence of *Lutreolina* across Venezuela, Colombia, Ecuador, northeast Brazil, [and] Perú . . . is due to the small amount of material which has been collected over this large area. We must await new investigations in order to know the reality of the problem."

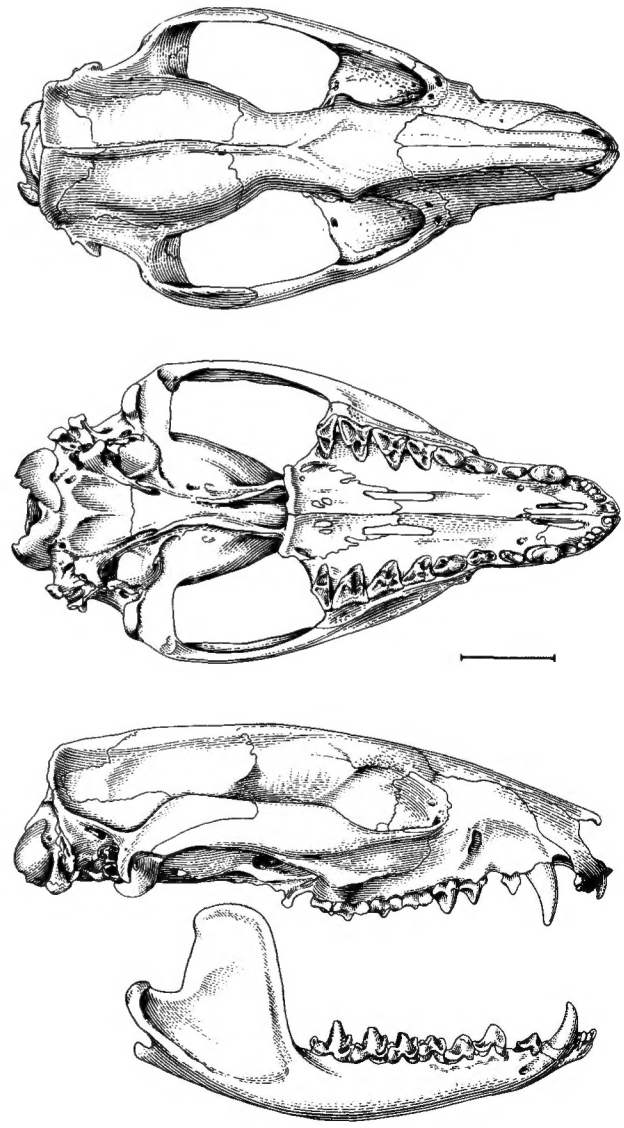

FIGURE 1. Skull of *Lutreolina crassicaudata* in dorsal, ventral, and lateral views (from top to bottom), and jaw in lateral view. MVZ 134223, young female, from 24 km SE Magdalena, Buenos Aires Province, Argentina. The scale is 10 mm long. Drawn by Mrs. J. P. Lufkin.

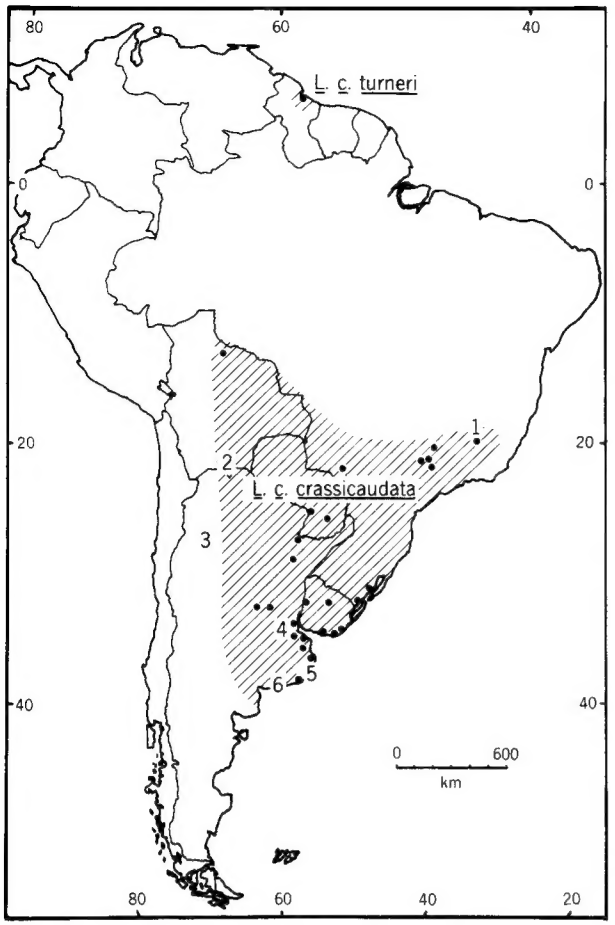

FIGURE 2. Map showing the geographic distribution and fossil occurrences of *Lutreolina*. Solid circles represent specific localities referred to in the literature and from which specimens have been collected; hatching represents the presently occupied range, based on all literature references. For literature sources see text. Numbers refer to fossil occurrences: 1, Minas Gerais, Brazil (late Pleistocene-Lujanian); 2, Tarija, Bolivia (late Pleistocene-Lujanian); 3, Corral Quemado Formation, Catamarca Province, Argentina (medial Pliocene-Huayquerian); 4, Río Luján, Buenos Aires Province, Argentina (late Pleistocene-Lujanian); 5, Chapadmalal Formation, Buenos Aires Province, Argentina (latest Pliocene-Chapadmalalan); and 6, Monte Hermoso Formation, Buenos Aires Province, Argentina (late Pliocene-Montehermosan).

The distribution of *L. crassicaudata* shown in figure 2 is based on the following literature sources: Cabrera (1957:39–40), Cabrera and Yepes (1960:28), Hershkovitz (1972:403), Krumbiegel (1941:191, fig. 1), Thomas (1888:336; 1923:584), Vieira (1949:356), and Ximénez (1967:4, table 1).

FOSSIL RECORD. Lydekker (1887:280–81) referred a fragment of a left mandibular ramus from late Pleistocene (Lujanian) deposits in the caves of Minas Gerais, Brazil, to *Didelphys crassicaudata*. Ameghino (1889:282) later applied the name *Didelphys crassicaudata fossilis* to the same specimen.

A specimen of *Lutreolina* was recorded from the Tarija (late Pleistocene-Lujanian) fauna of southern Bolivia (Hoffstetter, 1963:195). Hoffstetter noted that this specimen "appears to represent a new species very similar to the living *L. crassicaudata*."

Specimens referred to *Lutreolina* (cf. *crassicaudata*) were recorded from the Chapadmalal Formation (latest Pliocene-Chapadmalalan), Buenos Aires Province (Reig, 1958:268; Simpson, 1972:12), and from the Corral Quemado Formation medial Pliocene-Huayquerian), Catamarca Province, Argentina (Riggs and Patterson, 1939:148; Simpson, 1974:10). *Lutreolina lujanensis* (Ameghino, 1889:279) from late Pleistocene beds along the Río Luján, Buenos Aires Province, and *Lutreolina tracheia* (Rovereto, 1914: 148) from the late Pliocene Monte Hermoso Formation (Montehermosan), Buenos Aires Province, Argentina, are similar to, and may even prove to be synonymous with, *L. crassicaudata*.

FORM. Reig (1958) reviewed the dental and some cranial characters of this species and made comparisons with other living and fossil Didelphidae.

L. crassicaudata exhibits remarkable size variation, with some fully adult specimens being only one half the size of others of the same sex (Thomas, 1888:335). Part of this variation is attributable to the fact that these animals, like other didelphids, do not attain maximum or near maximum size until long after reaching sexual maturity (Cabrera and Yepes, 1960:28).

Cabrera (1957:40), Cabrera and Yepes (1960:28), and Ximénez (1967:4) all noted that coat color in *L. crassicaudata* is extremely variable. The upper parts are generally a rich, soft yellow, buffy, or dark brown, and the underparts a reddish ochraceous or pale to dark brown. Changes in coat color occur in specimens maintained in captivity, with changes in diet, and color is influenced by local environment. Cabrera (1957:40) recorded one instance where specimens of a red color and others of a much paler hue were obtained at one locality. At one time the pelts of these animals were used in Argentina as fur for trimming garments, but, inasmuch as the color soon fades from the hairs, the market has declined (Walker *et al.*, 1968:23).

FUNCTION. Scaravilli *et al.* (1974) studied neocortical electrical activity of *L. crassicaudata* in animals with chronically implanted electrodes, and showed a marked difference between wakefulness and the paradoxical phase of sleep. The presence of a well defined *theta* rhythm was observed in the leads from the caudal part of the dorsal surface of the brain hemispheres.

REPRODUCTION. Walker *et al.* (1968:23) reported that *L. crassicaudata* breeds in the spring and again later in the year, when the young of the first litter have become independent. The young are raised in a nest of dry grass. The gestation period is believed to be about two weeks.

ECOLOGY. *L. crassicaudata* is mostly restricted to grassland, savanna grassland, and gallery woodland habitats. In the provinces of Buenos Aires, Entre Ríos, and Corrientes of Argentina, in Uruguay, and in southernmost Brazil, it frequents the pampas or temperate grasslands; in northern Argentina, Bolivia, and Paraguay, it is found mostly in savanna woodlands of the Chaco; and in southern Brazil on about the same latitude as Rio de Janeiro, it has been collected in tropical grassland and gallery woodland environments.

L. crassicaudata is weasel-like in shape and habits; it is regarded as the marsupial equivalent of placental weasels and is called "comadreja" (weasel) by Spanish-speaking natives (Hershkovitz, 1972:374). It is both terrestrial and aquatic, frequenting low-lying lands subject to periodic flooding and mostly devoid of trees (Lydekker, 1894:204). It climbs well, is agile on the ground and is an excellent swimmer. Lydekker (1894:204) noted that "it dives and swims with ease in the small *lagunas* (lagoons) dotted over the pampas, constructing a globular nest of grass suspended from the flags and rushes which abound in such spots." It is certainly the species of didelphid best adapted to life on the pampas (Cabrera and Yepes, 1960:29).

In wooded areas it often seeks shelter in tree holes, but in wet areas it constructs a snug nest of grasses and rushes among reeds, and on the pampas it often utilizes abandoned armadillo and viscacha burrows. It is nocturnal and in the wild preys on small mammals, birds, reptiles, fishes, and insects (Walker *et al.*, 1968:23).

In 1860, the London Zoological Gardens held in captivity what apparently was the first specimen of *L. crassicaudata* to be acquired by a zoo. The New York Zoological Society was maintaining a trio of these didelphids in 1966, and a specimen in private hands for three years died in the Leipzig Zoo in 1930 (Collins, 1973:75). Davis (1966) reported that the three in New York thrived on a diet of sliced butterfish mixed with meat, and on frogs, earthworms, shrimp, and mice.

GENETICS. Saez (1938) and Wainberg and Fronza (1969) reported *L. crassicaudata* to have a diploid number of 22 chromosomes. The X chromosome is metacentric and the Y is acrocentric.

REMARKS. Various subspecies or local races have been recognized, mostly on the basis of specimens collected from diverse localities and deposited in the British Museum (Natural History), London. Most of these races are ill-defined and of dubious, if any, validity.

Günther (1879:108) erected "*Didelphys turneri*" on the basis of a male specimen (type BM 79.5.1.3) collected from Better Hope on the Río Demerara, British Guiana (Guyana). Thomas (1888:334) synonymized this species with "*Didelphys*" *crassicaudata* and recorded a second specimen (a female) from the same locality. Thomas (1888:336) noted that "as a rule" specimens from southern Brazil, Uruguay, and Argentina are markedly

larger than those from British Guiana. He recorded, however, that a specimen from Maldonado, Uruguay, has a skull "exactly matching in every way" that of the female from Demerara. The holotype of *turneri* differs from known specimens of *L. crassicaudata* from Brazil, Uruguay, and Argentina in having only four upper incisors on each side, "but specimens since received from the same locality show this to have been an abnormality" (Thomas, 1888:336).

The specimens from British Guiana were recognized as a subspecies of *L. crassicaudata* by Thomas (1923:584) on the basis of their comparatively small size (skull length of male, 60 mm, that of female, 52 mm, the latter being the smallest adult skull in the collection of the British Museum (Natural History). General color is dark brown.

L. c. crassicaudata, as recognized by Thomas (1923:584), was based on specimens from Paraguay and others from "the Chaco west of Asunción" (provinces of Formosa or Chaco of Argentina). The nominate subspecies was diagnosed as of larger size than *turneri* (skull lengths of males, 60 to 65 mm, those of females, 55 to 59 mm). Color grayish olivaceous. The holotype of *crassicaudata* is not in existence (Thomas, 1888:335).

A third subspecies recognized by Thomas (1923:584) was *L. c. paranalis*. Its range was listed as "Provinces of Santa Fe, extending apparently to the delta of the Parana and eastward to Montevideo." Other specimens were from Noetinger, which is in the province of Córdoba (not Santa Fe as indicated by Thomas). The holotype (BM 17.5.2.22) is from Las Rosas, Santa Fe Province, Argentina. Thomas (1923) noted that the range of this subspecies, both to the north and south, "is as yet rather doubtful." He further noted that *L. crassicaudata* occurs all along the Río Paraná, so that there is no "gap" that might indicate a "specific" separation between *L. c. crassicaudata* and *L. c. paranalis*. This subspecies was diagnosed as: size large; skull of male and females of similar size; skull length of a male was 69 mm, those for females from 61 to 70 mm. General color comparatively dark brown to buffy brown. Skin with a more persistent purplish tinge than occurs in other subspecies.

A fourth subspecies recognized by Thomas (1923:585) was *L. c. bonaria*. Its distribution included the Province of Buenos Aires, Argentina, from the neighborhood of Buenos Aires to Cape San Antonio. The type (BM 20.2.7.44) is from Los Yngleses, Ajo. The diagnosis was given as: average size slightly larger than in *L. c. paranalis*; sexes of similar size. General color paler, more yellowish buffy. Under surface also paler. Skull length of a male was 75 mm, those of two females, 76 and 65 mm.

The fifth and last subspecies erected by Thomas (1923:585) was *L. c. lutrilla*. Specimens referred to this taxon were from Rio Grande do Sul, Brazil, and southeastern Uruguay. The holotype (BM 85.6.26.26) is from Rio Grande do Sul, Brazil. The diagnosis included: size decidedly smaller than other southern races (*L. c. crassicaudata*, *L. c. paranalis*, and *L. c. bonaria*). A male had a skull length of 60 mm, whereas the female holotype measured 58 mm. The skin color could not be determined on the specimens at hand. The geographic distribution of the five subspecies recognized by Thomas is shown in Krumbiegel (1941:fig. 1).

A sixth subspecies, *L. c. travassosi*, was erected by Miranda Ribeiro (1936:402) based on specimens from Guariba in the State of São Paulo, Brazil. Since that time, a number of these names have been relegated to synonymy. Vieira (1949:355) considered *L. c. travassosi* a synonym of *L. c. crassicaudata* and this arrangement was later followed by Cabrera (1957: 39). Cabrera (1957:40) also recognized *L. c. bonaria* as a junior synonym of *L. c. paranalis*.

The distribution of the four subspecies recognized by Cabrera (1957) is as follows: *L. c. crassicaudata* inhabits Paraguay, northeast Argentina in the provinces of Formosa and Misiones, and the southeast of Brazil, including the states of São Paulo and the south of Mato Grosso; *L. c. turneri* is known only from Guyana; *L. c. paranalis* is found across the eastern part of Argentina, from the provinces of Santa Fe and Corrientes to the south of Buenos Aires, reaching La Rioja and San Juan in the west and extending into Uruguay in the east; and *L. c. lutrilla* occurs in the extreme south of Brazil in the state of Rio Grande do Sul and extends along the coast of Uruguay to Maldonado.

Ximénez (1967) recently studied a large sample of *L. crassicaudata* from Argentina, Uruguay, and Brazil. He concluded that *L. c. lutrilla* was indistinguishable from *L. c. paranalis* and recognized the presence of but a single race in Uruguay, *L. c. paranalis*. Ximénez also questioned the validity of *L. c. turneri*, pointing out that it may not warrant separation from *L. c. paranalis*. Specimens of *L. crassicaudata* from Paraguay were not available to Ximénez, preventing a decision regarding the validity of the distinction between *L. c. crassicaudata* and *L. c. paranalis*.

Thomas (1923:584) listed *L. c. crassicaudata* as being of large size with skull lengths ranging from 70 mm in males to 55 mm in females. This size range falls well within the sample of *L. c. paranalis* (including *L. c. lutrilla*) studied by Ximénez (1967: table 1). These data suggest that there is no basis for retention of *L. c. paranalis* and *L. c. crassicaudata* as distinct races. I am inclined to relegate the former to the synonymy of *crassicaudata* and have done so here.

Thus, two races of *L. crassicaudata* are tentatively recognized: *L. c. crassicaudata* to include the large southern population, and *L. c. turneri* to include the isolated Guyana population. Further research is clearly needed to substantiate and better document this arrangement.

ETYMOLOGY. The generic name *Lutreolina* is formed from the Latin word *Lutreola* (meaning otter or, by extension, weasel) and refers to the otter-like or weasel-like form of this animal. The specific name *crassicaudata* is formed from two Latin words, *crassus* (thick, fat, or stout) and *cauda* (tail) in reference to the fat tail of the animal.

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Principal editor of this account was SYDNEY ANDERSON.

L. G. MARSHALL, DEPARTMENT OF PALEONTOLOGY, UNIVERSITY OF CALIFORNIA, BERKELEY, 94720.